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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,996	02/14/2002	Caroline S. Harris	1660A1	9847

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PPG Industries, Inc.
Intellectual Property Dept.
One PPG Place
Pittsburgh, PA 15272

EXAMINER

BLACKWELL RUDASIL, GWENDOLYN A

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/075,996

Applicant(s)

HARRIS ET AL.

Examiner

Gwendolyn Blackwell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-52 and 54-57 is/are pending in the application.
- 4a) Of the above claim(s) 40-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39, 54-57 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-39 and 54-57 are currently pending and examined on the merits. Claims 40-52 are withdrawn to a non-elected invention. Claim 53 is canceled.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 6, 2005 has been entered.

Response to Arguments

3. Applicant's arguments with respect to claims 1-39 and 54-57 have been considered but are moot in view of the new ground(s) of rejection set forth below.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

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international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-19, 21-25, 32-33, 36-39, and 54-57 are rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent no. 6,312,131, Yamamoto et al.

Regarding claims 1, 36, 38, and 39

Yamamoto et al disclose a hydrophilic mirror coated with a multilayer coating, wherein the outermost surface layer has an average roughness of 0.5-25 nm, (column 4, lines 11-18). In one embodiment, the titanium oxide layer has an anatase structure increasing the photocatalytic effect as well as the hydrophilicity, (column 3, lines 17-19). The coatings are formed by vacuum deposition, sputtering, chemical vapor deposition, or spray pyrolysis, (column 5, lines 24-29), meeting the requirements of claim 1.

Yamamoto et al also disclose that the coatings are formed using an on-line coating system which is comprised of the coatings being formed on one surface of the glass substrate while it is floating on molten tin in a float bath, (column 5, lines 30-40), meeting the requirements of claim 36.

Yamamoto et al further disclose that the titanium oxide layer has a thickness in the range between 10-200 nm (100-2000 Å), (column 4, lines 55-61). As Yamamoto et al does not disclose that the coating is porous, absent a showing to the contrary, the coating will be taken to be substantially non-porous, meeting the requirements of claim 38.

In addition to what Yamamoto et al disclose above, it is further disclosed that the coating is formed by CVD in a float bath at temperatures ranging between 600-700°C, (column 6, lines 14-18), meeting the requirements of claim 39.

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Regarding claim 2-5, 17-19, 32, 37, and 55

When the structure recited in the reference is substantially identical to that of the claims, the claimed properties or function are presumed inherent. *MPEP 2112.01*. Because the prior art exemplifies the applicant's claimed photo-induced hydrophilic-coated substrate, the claimed physical properties relating the water contact angle and photocatalytic activity are inherently present in the prior art. Absent an objective showing to the contrary, the addition of the claimed physical properties to the claim language fails to provide patentable distinction over the prior art of record, meeting the requirements of claims 2-5, 17-19, 32, 37, and 55.

Regarding claims 6-15 and 57

The titanium oxide layer has a thickness in the range between 10-200 nm (100-2000 Å), (column 4, lines 55-61), meeting the requirements of claims 6-12 and 57. The titanium oxide layer has an anatase structure increasing the photocatalytic effect as well as the hydrophilicity, (column 3, lines 17-19), meeting the requirements of claim 13. As Yamamoto et al does not disclose that the coating is porous, absent a showing to the contrary, the coating will be taken to be substantially non-porous, meeting the requirements of claims 14-15.

Regarding claims 16 and 21-22

The outermost surface layer has an average roughness of 0.5-25 nm, (column 4, lines 11-18), meeting the requirements of claim 16. Between the hydrophilic titanium oxide layer and the substrate an undercoat layer is formed to prevent alkali diffusion to the other layers, (column 3, lines 62-67), meeting the requirements of claims 21-22.

Regarding claims 23-25, 33, 35, 54, and 56

The coatings are formed by vacuum deposition, sputtering, chemical vapor deposition, or spray pyrolysis, (column 5, lines 24-29), using an on-line coating system which is comprised of

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the coatings being formed on one surface of the glass substrate while the second surface is floating on molten tin in a float bath, (column 5, lines 30-40), meeting the requirements of claims 23-25, 54, and 56. On the surface opposite to the one covered by the hydrophilic coating, an opaque film is formed to obscure the back-side image, (column 5, lines 16-22), meeting the requirement of claims 33 and 35.

6. Claims 1, 2-12, 17-19, 21, 24-26, 29-33, 36, 54, and 57 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent no. 5,871,843, Yoneda et al.

Regarding claim 1

Yoneda et al disclose a laminate substrate having low reflecting and stain-proofing (hydrophilic) properties, (column 6, lines 14-23). The laminate has a flat portion having a surface roughness of at most 3 nm, (column 3, lines 15-20).

The limitations of the hydrophilic coating and surface roughness are set forth above. The limitations regarding the deposition of the hydrophilic film in a float glass process through CVD in a particular temperature range are process limitations. Yoneda et al disclose that the some of the coatings on the substrate can be deposited through sputtering or CVD, (column 11, lines 55-65). "If the product in the product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *See MPEP 2113*. As such, the process limitations within claim 1 do not provide patentable distinction between the claimed invention and the prior art of record, meeting the requirements of claim 1.

Regarding claims 2-10, 17-19, and 32

The coating has a thickness of preferably at most 30 nm (300 Å), (column 6, lines 24-27), meeting the requirements of claim 6-10. Because the prior art exemplifies the applicant's

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claimed photo-induced hydrophilic-coated substrate, the claimed physical properties relating the water contact angle and photocatalytic activity are inherently present in the prior art.

Regarding claims 24-25, 36, 39, 54, and 57

The limitations of the hydrophilic coating, surface roughness, and thickness are set forth above. Because the limitations regarding the deposition of the hydrophilic film in a float glass process through CVD in a particular temperature range are process limitations, the process limitations within claims 24-25, 36, 39, 54, and 57 do not provide patentable distinction between the claimed invention and the prior art of record.

Regarding claims 11-12

Titanium oxide can be used for the photocatalytic layer, (column 6, lines 14-54), meeting the requirements of claims 11-12.

Regarding claims 21 and 33

Between the hydrophilic coating and the substrate an interlayer can be employed, (column 11, lines 13-18), meeting the requirements of claim 21. The interlayer can be used to prevent reflection (anti-reflective film), (column 11, lines 3-12), meeting the requirements of claim 33. Other coatings relating to an antistatic film, colored film, electromagnetic wave-shielding film, UV ray absorbing film (solar control) and a heat ray reflecting film can be used to control various properties of the coated glass, (column 11, lines 50-65), meeting the requirements of claim 34.

Regarding claims 26 and 29-31

The laminate can be applied to automobile windshields wherein the coating is applied to the exterior and interior surfaces of the windshield, (Example 18, column 18, lines 43-60),

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meeting the requirements of claims 26, 29, and 31. The window can be used a window glass used in buildings, (columns 12, lines 33-39), meeting the requirements of claim 30.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-13, 16-19, 21-22, 24-28, 30, 32-34, 36, 38-39, 54, and 56-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent no. 5,873,203, Thiel in view of Japanese Patent Application Publication no. 11-090237, JP '237.

Regarding claims 1 and 16

Thiel disclose a multiple glazed window unit comprised of at least two glass sheets with a photocatalytically-activated (hydrophilic) self cleaning coating formed over at least a portion of at least one of the interior surfaces as well as the exterior surfaces, (column 8, lines 9-30). The

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coating maybe formed using spray pyrolysis, CVD, sputtering, or vacuum deposition, (column 13, lines 52-67). Thiel does not specifically disclose the amount of surface roughness associated with the photocatalytic coating.

JP '237 disclose a photocatalytic(hydrophilic) coating formed on a substrate with a surface roughness of 0.1-10 nm, (abstract). The coating can be used on a windowpane or a base material such as glass, (page 3, sections 0036-0037).

Thiel and JP '237 disclose analogous inventions related to the used of photocatalytic coatings on substrates used to remove contaminants from the coated substrate surface. It would have been obvious to one skilled in the art at the time of invention to modify the surface of Thiel with the surface roughness of JP '237 in order to increase the surface area of the photocatalytic film, which in turns increases the photocatalytic activity without making the film surface so rough that contaminants will become trapped on the surface, (JP '237, pages 3-4, sections 0047-0055).

Regarding claims 2-5

It is preferred that the hydrophilic coating have a contact angle of less than about 5 degrees, (Thiel, column 11, lines 45-65), claims 2-5.

Regarding claims 6-10

The coating has a thickness of at least 200 Å, (Thiel, column 12, lines 60-67), claims 6-10.

Regarding claims 11-13

Oxides such as titanium (anatase, rutile, and/or brookite), silver, iron, copper, tungsten, aluminum, silicon, zinc stannate, molybdenum, zinc, strontium titanate and mixtures thereof can be used for the photocatalytic layer, (Thiel, column 12, lines 5-12), claims 11-13.

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Regarding claims 17-19 and 32

The coating has a photocatalytic activity of at least $2 \times 10^{-3} \text{ cm}^{-1} \text{ min}^{-1}$, more preferably $5 \times 10^{-3} \text{ cm}^{-1} \text{ min}^{-1}$, (Thiel, column 13, lines 34-36), claims 17-19 and 32.

Regarding claims 21-22 and 33-34

In addition to the hydrophilic coating, additional functional coatings which exhibit optical, thermal, safety, aesthetic, solar control properties, or mixtures thereof can be formed on either or both glass sheets of the glazing, (Thiel, columns 5-6, lines 64-13), claims 21-22 and 33-34.

Regarding claims 26-28 and 30

The multiple glazed window unit has two or more glass sheets wherein the coating can be formed on either interior surface or exterior surface, (Thiel, columns 3-4, lines 35-15), claims 26-28 and 30.

Regarding claims 24-25, 36, 38-39, 54, and 56-57

The limitations of the hydrophilic coating, surface roughness, and thickness are set forth above. The limitations regarding the deposition of the hydrophilic film in a float glass process through CVD in a particular temperature range are process limitations. Thiel discloses that the coating can be formed using CVD, (column 13, lines 52-59). "If the product in the product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *See MPEP 2113*. As such, the process limitations within claims 24-25, 36, 38-39, 54, and 56-57 do not provide patentable distinction between the claimed invention and the prior art of record.

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10. Claims 1 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent no. 6,387,514, Legrand in view of Japanese Patent Application Publication no. 11-090237, JP '237.

Regarding claims 1 and 20

Legrand disclose a solar control coated substrate wherein the coated substrate has a visible light reflectance of at least 10%, (column 2, lines 41-50). The coated substrate can be a multiple glazed panel or laminated panel used in buildings, (column 3, lines 4-19). Example 7, (Table 1, columns 7-8), demonstrate a visible reflectance of 20%. Legrand does not specifically disclose that the surface layer is hydrophilic having a surface roughness of less than 1 nm.

JP '237 discloses a photocatalytic(hydrophilic) coating formed on a substrate with a surface roughness of 0.1-10 nm, (abstract). The coating can be used on a windowpane or a base material such as glass, (page 3, sections 0036-0037).

Legrand and JP '237 disclose analogous inventions related to multiple glazed windows that are coated with particular coatings to achieve a desired optical or physical effect. It would have been obvious to one skilled in the art at the time of invention to modify the surface of Legrand with the hydrophilic photocatalytic coating of JP '237 in order to provide a glazing surface with increased surface area of the hydrophilic film, which in turns increases the photocatalytic activity without making the film surface so rough that contaminants will become trapped on the surface, (JP '237, pages 3-4, sections 0047-0055).

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gwendolyn Blackwell whose telephone number is (571) 272-1533. The examiner can normally be reached on Monday - Thursday, 5:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gwendolyn Blackwell
Examiner
Art Unit 1775

gab


DEBORAH JONES
SUPERVISORY PATENT EXAMINER